A Summary Report

To The

North Central High Schools

Of Kansas

On Criterion 5:

School Plant and Equipment

By

KENNETH E. ANDERSON

WITH AN ADDENDUM:

Acoustical Considerations of School Buildings

By

JAMES F. NICKERSON

KANSAS STUDIES IN EDUCATION

UNIVERSITY OF KANSAS PUBLICATIONS

SCHOOL OF EDUCATION - LAWRENCE, KANSAS

Vol. 3 APRIL, 1953 No. 3

FOREWORD

This is the fourth of a series of reports on the Evaluative Criteria of the North Central Association of Colleges and Secondary Schools. This summary report of Criterion 5 is submitted with the hope that its contents will prove to be interesting and that it will stimulate the North Central Schools of Kansas to increase their efforts in providing a better educational program for the youth of Kansas.

An addendum, "Acoustical Considerations of School Buildings" by Dr Nickerson, has been added to this report because the *Special Report on Criterion 5* has seemingly ignored the problem of acoustics in school buildings except for one item under Section F: The Library, Location and Equipment. *The University of Kansas Bulletin of Education,* Volume 7, Nos. 1, 2 and 3 carry a series of articles on schoolroom acoustics by Dr. Nickerson. These are available on request as are Dr. Nickerson's services.

The present study was sanctioned by the Kansas State Committee of the North Central Association consisting of the following members: Ralph Stinson, Chairman, State Department of Education; Kenneth E. Anderson, University of Kansas; Walter L. Cooper, Principal, Wichita East High School; Floyd C. Smith, Principal, Iola High School; and Fred Howell, Principal, Haven High School.

Kenneth E. Anderson

Table of Contents

	PAGE
PART I—EXPLANATION OF THE STUDY	1
PART II—GENERAL FACTORS AFFECTING THE SCHOOL BUILDING PROGRAM	6
COMMUNITY FACTORS	6
EDUCATIONAL FACTORS	9
PART III—SCHOOL PLANT AND EQUIPMENT	11
I. GENERAL INFORMATION	11
II. THE SITE	12
III. THE BUILDING OF BUILDINGS	12
IV. BUILDING SERVICES	13
V. INSTRUCTIONAL SPACE, EQUIPMENT AND SUPPLIES	14
VI. THE LIBRARY, LOCATION AND EQUIPMENT	14
VII. SPECIAL SERVICES	16
VIII. STORAGE AND PROTECTION OF RECORDS AND SUPPLIES	17
PART IV—PLANS FOR POSSIBLE FUTURE DEVELOPMENT	18
PART V—SUMMARY	19
ADDENDUM: ACOUSTICAL CONSIDERATIONS OF SCHOOL BUILDINGS	21

THE UNIVERSITY OF KANSAS SCHOOL OF EDUCATION

DEAN, SCHOOL OF EDUCATION ..... Kenneth E. Anderson
EDITOR, *Kansas Studies in Education* ..... Oscar M. Haugh

A Summary Report to the North Central Schools of Kansas

KENNETH E. ANDERSON, *Dean*
School of Education, University of Kansas

PART I

Explanation of the Study

The present report is the fourth in the series of summary reports to the North Central High Schools of Kansas. The first concerned Criterion I: Philosophy and Objectives, for the school year 1948-49. The findings were published by the School of Education of the University of Kansas in December, 1949. The second summary report concerned Criterion II: Educational Program, Sections A, E and F for the school year 1949-50. Like its predecessor, this report was published in a mimeographed edition by the School of Education of the University of Kansas. It was released in October, 1950.

In order to preserve the findings of these summary reports in more permanent form, the third report for the school year 1950-51, concerning Criterion II: Educational Program, Sections B, C and D, was published in January, 1952 as Volume 3, No. 1 of *Kansas Studies in Education*. The present report has likewise been included in this same series of University of Kansas publications.

So that the reader will be able to follow the findings of this summary report, which covers the school year 1951-52, without referring back to the original report form distributed in September, 1951, the questions and all explanatory material will be quoted verbatim as they appeared in Form A-3 of "Special Report on Criterion 5 to the Commission on Secondary Schools, North Central Association of Colleges and Secondary Schools."

The Introduction to Section 1 reads as follows:

> It is the conviction underlying this study of Criterion 5, *School Plant and Equipment,* that school buildings and facilities should be appraised in terms of the educational program to be carried out. At least two corollaries stem from this conviction. In the first place, all those concerned with the character of the educational program, staff, pupils, and the supporting community, should have a part in evaluating the adequacy and effective utilization of the present plant and in planning future developments. In the second place, both present plant and future extensions should be studied in the light of the special characteristics of the local community and foreseeable trends in the scope and character of secondary education.

The Special Report for 1951-52 follows logically the three which preceded it and which were based upon Criteria 1 and 2, *Philosophy and Objectives,* and the *Educational Program.* To obtain the maximum benefit

from the present study the school will refer frequently to the earlier studies as a basis for appraising the present school facilities and planning future extensions.

It may be appropriate to point out the timeliness of a study of secondary school plant in 1951-52. An increasing number of school systems will be faced with the imminent problem of providing secondary school facilities for the children now swarming into the elementary school as a result of the high birthrate during the years 1940 to 1950. By 1955 this pressure will be serious, accentuated by the obsolescence of many buildings now in use and by the increased demands on space and facilities which newer trends in secondary education present.

The Special Report for 1951-52 is divided into three parts. Section One deals with general factors affecting school plant development and is concerned primarily with conditions in the community, characteristics of the pupil population, and trends in secondary education which have implications for the school plant. Section Two is directed specifically toward the various subsections of Criterion 5—building and site, library, instructional equipment, etc.,—and is concerned both with the adequacy of the present plant for the educational program and with contemplated improvement. Section Three provides an opportunity for all participants in the study of Sections One and Two to present suggestions, (a) for the remodeling and modernization of the present plant, and (b) for developing a future building program.

Criterion 5 is composed of seven sections. Each was explained in Form A-3 to the reporting schools as follows:

A. *The School Plant.* The school plant should be flexible, adequate in size, and so planned as to facilitate the offering of a modern program of secondary education that is suited to the needs and interests of the pupils and of the community. When a new plant is being planned, or an existing building is to be enlarged or remodeled, plans should contemplate meeting future as well as present needs. The building should be attractive and appropriate in design and should assure the safety and health of its occupants. The site should be large enough to provide ample playground space and should be attractively landscaped.

B. *The Library.* 1. Materials. The number and kind of library and reference books, periodicals, newspapers, pamphlets, and vertical file materials should be adequate for the number of pupils enrolled and should meet the interests of the pupils and the needs of instruction in all courses offered.

2. Location and Equipment. a. The library room, or combination library-study hall, should be easily accessible, should accommodate approximately ten per cent of the enrollment, should be attractive in appearance, and should contain standard library equipment, such as: reading tables, desks or desk-chairs, librarian's desk, cabinets for card catalogs, magazine and newspaper racks, dictionary stands, and filing cabinets. In judging library space, consideration should be given to modifying factors in individual schools and to the extent to which library facilities are decentralized.

b. The record system should include a shelf list, alphabetically arranged card catalogs, an accession record, and should be classified by the Dewey Decimal system or other classification system acceptable to the State Committee. The central library may be supplemented by departmental or classroom libraries of frequently changed materials appropriate to the work of individual classes.

C. *Sanitation.* Janitorial service, lighting, heating, ventilation, water supply and drinking fountains, lavatories and toilets, wardrobes and lockers, school furniture, and location of the classrooms, shops, laboratory, and library should be such as to insure hygienic conditions for pupils and teachers.

D. *Safety.* Proper steps for protecting pupils against injuries should be taken in laboratories, shops, gymnasiums, transportation facilities, and in all parts of the building or grounds where accidents are likely to occur. The school plant should be adequately protected against fire and should have fire exits.

E. *Instructional Equipment and Supplies.* Instructional equipment and supplies, such as: science apparatus, laboratory tables and demonstration desks; shop tools and machinery; gymnasium equipment and supplies; equipment for home economics and agricultural laboratories; equipment and supplies for commercial, art, and music rooms; audio-visual aids equipment: maps and charts; library books, text books, and supplies should be adequate and used in such a way as to meet the needs of instruction for all courses and activities offered.

F. *Special Services.* Adequate provision should be made according to the individual needs of each school for such special services as rest rooms, cafeteria, dining rooms, kitchens, clinics, infirmary facilities, and study and sleeping quarters.

G. *Protection of Pupil Records; Care and Storage of Equipment and Supplies.* Ample provision should be made for the safekeeping, systematic arrangement, and care of all materials, supplies, and apparatus used in the instructional and activity program, and the storage of all financial and personnel records and reports. An annual inventory is made of all equipment and supplies. A fireproof vault should be provided, or a safe which meets underwriters' specifications.

The North Central high schools of Kansas were not required to submit their report or study of Criterion 5. Of the 208 member schools in the state, 102 submitted their reports to the state committee. Therefore, no claim is made as to the representative quality of the data obtained.

In order to note differences that might exist in the data, due to the size of school, the 102 schools were placed in one of four categories with the following results: 16 schools enrolling 99 or less pupils; 55 schools enrolling from 100-299 pupils; 26 schools enrolling from 300-999 pupils, and 5 schools enrolling over 1000 pupils.

In studying and reporting on the various sections of Criteria 5, schools were given the following general instructions:

A. Preparation of the Report:

The Special Reports (Form A-3) differ from the earlier report forms issued by the Commission as well as from the annual reports on Regulations (Form A-1) in two important respects. In the first place, the school is encouraged to take the entire school year for carrying out the investigations, deliberations, and group discussions on which the report will be based. Whereas the other forms on which schools report annually are to be returned to the State Chairman on or before November 15, the Special Reports are not due until June 1 of the current school year.

Secondly, it is intended that the collection of data and completion of the report involve the cooperative endeavor of the entire staff and that the finished report represent a group judgment. It is believed that, in this way, the Special Reports may make their greatest contributions to improvement of school practices. It is further recommended that, wherever possible, pupils be involved in phases of the self-appraisal and that lay representatives be drawn into the planning and preparation of the report. Pupil judgments will be especially pertinent in relation to the pupil activity program and the guidance service, as well as in questions about the library service. Parent judgments will be helpful at all stages of the appraisal, and other civic groups may be asked to participate in various ways. It is hoped that the Special Reports may be effective in focusing the attention of teaching staff, student body, and community on the improvement of the school program as an endeavor of community-wide concern.

B. Steps in the Preparation of the Report:

Directions for completion of the several sections of the report are presented in the appropriate places. Certain general suggestions for carrying out the study are presented below:

1. Early in the school year the principal and his staff should study Form A-3 as a whole. Particular attention should be given to the instructions found at the beginning of the various sections.
2. A plan or organization which includes staff members, pupils, and lay members of the community should be agreed upon and put into operation.
   a. In large schools, sub-committees may be organized to work upon each of the three major sections of Form A-3. If this plan is followed, it may be desirable to have a coordinating committee made up of representatives of each sub-committee.
   b. In small schools the staff will probably wish to work as a unit in which one member or more becomes responsible for a given section.
3. A calendar for the year should be prepared. This calendar should apply to section committees as well as to the entire staff. It is recommended that, as the occasion arises or is called for by the calendar,

each committee (or individual staff member in small schools) make a report to the entire staff. Modifications of the tentative judgments should be made in terms of staff suggestions.

4. In large schools the coordinating committee should prepare the final report on the basis of the sub-committee reports that have been made to the entire staff. The staff of a small school may, as a unit, prepare this final report, or it may assign the duty to a special committee.

5. It is strongly emphasized that representatives of civic groups, the parent-teacher association, and other lay bodies participate in the committee work and that they have membership on the committee which prepares the final report. Committees should also utilize the services of pupils. The student council, classes in English, social studies, and other subjects that make extensive use of the library, and pupils in courses related to guidance should be able to assist in carrying on many phases of the study.

C. Use of the Results:

While the series of Special Reports will provide data which may be significant as indications of conditions and trends within states and for the Association as a whole, it cannot be emphasized too strongly that the chief values accrue to the school and its clientele. The studies made should enable them to appraise more accurately the elements of strength in the school program and the areas in which improvement is needed. In the light of the information secured, the school and its supporting public may make immediate and long term plans for continually improved service to the youth of the community. In order to secure the maximum benefits, it will be wise to provide for presentation and interpretation of the year's study at a public meeting at which the needs of the school as revealed by the study may be presented, and to utilize other means of publicity in the community.

One must point out that the results of summary studies such as this need to be interpreted with utmost caution. The results are not highly reliable but can serve as a springboard to further improvement and study.

Insofar as possible, the summary of replies to the questions and items pertaining to School Plant and Equipment will follow the report form used by the 102 schools. Whenever it is deemed necessary, the number or percentage of schools not replying to a particular question or item will be indicated so that the reader may better interpret the reported summaries.

PART II

General Factors Affecting the School Building Program

Community Factors

Section One, Part A, contains the following introductory statement to the questions:

> A community's *ability* and its *need* to expand its school building program depend upon many factors in the school's community. Some of the significant factors are presented in the following questions. The pattern of the questions is designed to bring out data for the school years of 1948-49 and 1951-52 in the hope that a comparison of the data for the two years will make it possible to hazard a prediction of the situation as it will probably be in 1958-59.

1. Financial Status of the School Community:
   a. In comparison with 1948-49, are the present financial resources of the community available for school purposes: (Check one) markedly greater? marked lower? about the same?

      Of the 102 schools in the study, 34.3 per cent checked *markedly greater*, none checked *markedly lower*, 61.8 per cent checked *about the same*, and 3.9 per cent did not reply to the question. Three of the five schools enrolling 1000 students or more checked *markedly greater*. For the three remaining categories according to decreasing size of school the percentages checking *markedly greater* were about 23 per cent, 35 per cent, and 44 per cent respectively.

   b. Is it probable that in 1958-59 they will be: (Check one) markedly higher? markedly lower?

      Of the 102 schools in the study, 63.7 per cent checked *markedly higher*, 8.8 per cent checked *markedly lower*, and 27.5 per cent did not reply to the question. For the four categories according to decreasing size of school, the percentages checking *markedly greater* were about 100 per cent, 65 per cent, 60 per cent, and 56 per cent respectively.

2. Community Interest in School:
   a. Has the readiness of the school community to provide good secondary education: (Check one) been uniformly high? shown marked increase? shown marked decrease? been uniformly low?

      The answers to this item were as follows: *been uniformly high*—69.6 per cent; *shown marked increase*—24.5 per cent; *shown marked decrease*—1.0 per cent; *been uniformly low*—2.9 per cent; and no reply—2.0 per cent. For the four categories of schools according to decreasing size of school the percentages checking *been uniformly high* or *shown marked increase* were 100 per cent, 100 per cent, 89.9 per cent, and 100 per cent respectively.

   b. Do you foresee an increase, or further increase, of such readiness by 1958-59?

      Of the 102 schools in the study, 70.6 per cent said *yes*, 22.5 per cent said *no*, and 6.9 per cent did not reply. For the four categories according to decreasing size of school the percentages saying *yes* were about 80 per-per cent, 58 per cent, 73 per cent, and 81 per cent respectively.

3. Changes in Geography of the School Community:

a. Is the school district geographically the same now as it was in 1948-49?

Of the 102 schools in the study, 64.7 per cent said *yes,* 31.4 per cent said *no,* and 3.9 per cent did not reply to the question. For the four categories of schools according to decreasing size of school, the percentages saying *yes* were about 60 per cent, 69 per cent, 62 per cent, and 69 per cent respectively.

b. Will it probably be geographically the same in 1958-59?

Of the 102 schools in the study, 56.9 per cent said *yes,* 39.2 per cent said *no,* and 3.9 per cent did not reply to the question. For the four categories of schools according to decreasing size of school the percentages saying *yes* were about 40 per cent, 62 per cent, 28 per cent, and 69 per cent respectively.

4. Reorganization of the School System:

a. Has the school been involved in a reorganization of the school system (by consolidation, by elimination, or addition of grades, by conversion to a junior high school, etc.) since 1948-49?

Of the 102 schools in the study, 23.5 per cent said *yes* and 76.5 per cent said *no.* For the four categories of schools according to decreasing size of school the percentages saying *yes* were 0.0 per cent, 15 per cent, 29 per cent, and 25 per cent respectively.

b. Is it likely to be involved in such a reorganization by 1958-59?

Of the 102 schools in the study, 22.5 per cent said *yes,* 74.5 per cent said *no,* and 3.0 per cent did not reply to the question. For the four categories of schools according to decreasing size of school the percentages saying *yes* were 0.0 per cent, 19 per cent, 25 per cent, and 25 per cent respectively.

5. Construction of Other Schools:

a. Has the construction or expansion of other secondary schools, public or private, reduced the enrollment of this school since 1948-49?

Of the 102 schools, 12.7 per cent said *yes* and 87.3 per cent said *no.* For the four categories according to decreasing size of school the percentages saying *yes* were about 20 per cent, 12 per cent, 9 per cent, and 25 per cent respectively.

b. Is it probable that the construction of other schools after 1951-52 will reduce the school's enrollment by 1958-59?

Of the 102 schools in the study, 10.8 per cent said *yes* and 89.2 per cent said *no.* For the four categories according to decreasing size of school the percentages saying *yes* were about 20 per cent, 15 per cent, 7 per cent, and 25 per cent respectively.

c. Has the closing of other elementary schools, public or private, increased the enrollment in this school since 1948-49?

Of the 102 schools in the study, 4.9 per cent said *yes,* 92.2 per cent said *no,* and 2.9 per cent did not reply to the question. For the four categories according to decreasing size of school the percentages saying *yes* were 0.0 per cent, 0.0 per cent, 7 per cent, and 6 per cent respectively.

d. Is it probable that the closing of other secondary schools will increase this school's enrollment by 1958-59?

Of the 102 schools in the study, 24.5 per cent said *yes,* 71.6 per cent said *no,* and 3.9 per cent did not reply to the question. For the four categories according to decreasing size of school the percentages saying *yes* were about 40 per cent, 12 per cent, 29 per cent, and 25 per cent respectively.

6. Compulsory School Age Law:

a. Has the administration of compulsory school attendance in 1951-52, in comparison with 1948-49, been: (Check one) more effective? less effective? about the same?

Of the 102 schools in the study, 4.9 per cent checked *more effective,* none checked *less effective,* 86.3 per cent checked *about the same,* and 8.8 per cent did not reply to the question.

b. Is it probable that the compulsory school age limit will be raised in your state by 1958-59?

Of the 102 schools in the study, 13.7 per cent said *yes,* 70.6 per cent said *no,* and 15.7 per cent did not reply to the question.

7. School's Holding Power:

a. Has the holding power of the school (however computed): (Check one) been uniformly high? shown marked increase? shown marked decrease? been uniformly low?

The answers to this item were as follows: *been uniformly high*—79.4 per cent; *shown marked increase*—13.7 per cent; *shown marked decrease*—0.0 per cent; *been uniformly low*—2.0 per cent; and no reply—4.9 per cent. For the four categories according to decreasing size of school the percentages checking *been uniformly high* were about 80 per cent, 88 per cent, 76 per cent, and 75 per cent respectively.

b. By 1958-59 do you expect the holding power of the school to show: (Check one) a marked increase? a marked decrease? no change?

The answers to this item were as follows: *a marked increase*—32.4 per cent; *a marked decrease*—0.9 per cent; *no change*—64.7 per cent; and no reply—2.0 per cent. For the four categories according to decreasing size of school the percentages checking *a marked increase* were about 40 per cent; 35 per cent, 27 per cent, and 44 per cent respectively.

8. Implications for Enrollment:

a. In the light of (1) answers to questions 3-7 above, (2) school enrollments in 1948-49 and 1951-52, and (3) the high birthrate in the years 1940-1950, what enrollment do you forecast for 1958-59?

For the three schools replying among those enrolling 1000 students or more, the enrollment forecast for 1958-59 was 126.4 per cent of that actually recorded in 1951-52.

For the twenty-one schools replying among those enrolling from 300-999 students, the forecast for 1958-59 was 123.3 per cent of that actually recorded in 1951-52.

For the forty-five schools replying among those enrolling from 100-299 students, the enrollment forecast for 1958-59 was 120.4 per cent of that actually recorded in 1951-52.

For the fourteen schools replying among those enrolling 99 students or less, the forecast for 1958-59 was 121.5 per cent of that actually recorded in 1951-52.

Educational Factors

Section One, Part B, contains the following introductory statement to the questions:

> The kind of high school building a community should have, the way in which it is planned, and the facilities which should be included are in a large measure determined by the nature of the educational program which the community wishes to provide or can provide and by the teaching methods used by the school staff. Answers to the following items will furnish a broad general background for evaluating the extent to which the school plant meets the educational needs of the secondary-school-age pupils of your community.

1. Does your secondary educational program meet the needs of *all* normal pupils through the twelfth grade?

   Of the 102 schools in the study, 69.6 per cent said *yes,* 28.4 per cent said *no,* and 2.0 per cent did not reply to the question. For the four categories according to decreasing size of school the percentages saying *yes* were about 60 per cent, 69 per cent, 67 per cent, and 81 per cent respectively.

2. Does your secondary school make any special provisions for the following types of pupils: a. Mentally handicapped? b. Scholastically handicapped? c. Physically handicapped?

   a. Mentally handicapped: Of the 102 schools in the study, 20.6 per cent said *yes* and 79.4 per cent said *no.* For the four categories according to decreasing size of school the percentages saying *yes* were about 60 per cent, 69 per cent, 67 per cent, and 81 per cent respectively.

   b. Scholastically handicapped: Of the 102 schools in the study, 49.0 percent said *yes* and 51.0 per cent said *no.* For the four categories according to decreasing size of school the percentages saying *yes* were about 100 per cent, 58 per cent, 42 per cent, and 44 per cent respectively.

   c. Physically handicapped: Of the 102 schools in the study, 36.3 per cent said *yes* and 63.7 per cent said *no.* For the four categories according to decreasing size of school the percentages saying *yes* were about 60 per cent, 42 per cent, 35 per cent, and 25 per cent respectively.

3. What instructional pattern does your school follow?
   a. Question-and-answer recitation: (Check one) Generally? Moderately? Rarely?

      Of the 102 schools in the study, 27.5 per cent checked *generally,* 67.6 per cent checked *moderately,* and 4.9 per cent checked *rarely.* For the four categories according to decreasing size of school the percentages checking *generally* were 0.0 per cent, 31 per cent, 31 per cent, and 19 per cent; and for those checking *moderately,* the percentages were about 80 per cent, 65 per cent, 64 per cent, and 81 per cent respectively.

   b. Varied learning activities with much pupil participation in: language arts, foreign language, social studies, science, mathematics: (Check one) Generally? Moderately? Rarely?

Of the 102 schools in the study, 53.9 per cent checked *generally*, 45.1 per cent checked *moderately*, and 1.0 per cent checked *rarely*. For the four categories according to decreasing size of school the percentages checking *generally* were about 60 per cent, 50 per cent, 56 per cent, and 50 per cent respectively; and those checking *moderately*, the percentages were about 40 per cent, 50 per cent, 42 per cent, and 46 per cent respectively.

4. Does your school provide:

a. Food services?

Of the 102 schools in the study, 55.9 per cent said *yes*, 41.2 per cent said *no*, 1.0 per cent said *partly*, and 1.9 per cent did not reply to the question.

b. Health services?

Of the 102 schools in the study, 47.1 per cent said *yes*, 16.7 per cent said *no*, and 36.2 per cent said *partly*.

c. Guidance services?

Of the 102 schools in the study, 64.7 per cent said *yes*, 9.8 per cent said *no*, and 25.5 per cent said *partly*.

d. Transportation services?

Of the 102 schools in the study, 47.1 per cent said *yes*, 42.2 per cent said *no*, 8.8 per cent said *partly*, and 1.9 per cent did not reply to the question.

e. Recreational services?

Of the 102 schools in the study, 83.3 per cent said *yes*, 0.0 per cent said *no*, and 16.7 per cent said *partly*.

f. Adult services?

Of the 102 schools in the study, 29.4 per cent said *yes*, 40.2 per cent said *no*, 26.5 per cent said *partly*, and 3.9 per cent did not reply to the question.

5. Below are listed some generally recognized emerging trends in secondary education. Check those which are reflected in your educational program: (a) Core program (involving flexible seating, room for resource materials and activities, ec.); (b) Classroom libraries; (c) The school as a center for community activities; (d) Use of audio-visual aids within the classroom; (e) Camping and outdoor education; (f) Work experience as part of the school program.

Of the five schools enrolling 1000 or more pupils, two checked (a); five, (b); five, (c); five, (d); two, (e); and four, (f).

Of the twenty-six schools enrolling from 300 to 999 pupils, 15 per cent checked (a), 65 per cennt, (b); 88 per cent, (c); 81 per cent, (d); 8 per cent, (e); and 58 per cent, (f).

Of the fifty-five schools enrolling from 100 to 299 pupils, 33 per cent checked (a); 69 per cent, (b); 85 per cent, (c); 98 per cent, (d); 15 per cent, (b); 85 per cent, (c); 98 per cent, (d); 15 per cent, (e); and 44 per cent, (f).

Of the sixteen schools enrolling 99 or less pupils, 56 per cent checked (a), 69 per cent, (b); 100 per cent, (c); 94 per cent, (d); 25 per cent, (e); and 44 per cent, (f).

PART III

School Plant and Equipment

The questions concerning section two, School Plant and Equipment, are preceded by the following introductory explanation:

> A knowledge of what now exists is necessary before we can suggest modifications or changes of any kind. Section Two has for its purpose the study of the present status of the school plant and equipment, in order that the community may determine how the present plant can be better utilized to serve the needs of its youth or what should be done preparatory to the construction of a new building.

I. General Information

1. In what year was the building (first unit) constructed? If enlarged, in what year or years was it enlarged?

All of the 102 schools in the study reported the date when the first unit was constructed. A little less than 10 per cent of the schools reported that the first unit was constructed before 1900, and 70 per cent of them found it was necessary to make one or more enlargements or additions to the first unit. About 68 per cent reported that the first unit was built during the years 1910-1929, and about 64 per cent of these found it necessary to make one or more enlargements or additions to the first unit. About 23 per cent of the schools reported the first unit as having been built since 1930. The oldest building was constructed in 1880 and was enlarged in 1921. The newest building was constructed in 1952. Table 1 presents detailed data concerning the period of building construction for the 102 schools presented in this report.

Table 1

Date of Construction of Building (First Unit) and Number of Additions Necessary

Decade	Building (First Unit)		Number of Additions		
	N	Per Cent	One	Two	Three
1880-1889	4	3.9	2	2	0
1890-1899	3	2.9	0	1	2
1900-1909	3	2.9	2	0	1
1910-1919	33	32.4	15	8	2
1920-1929	36	35.3	14	4	1
1930-1939	19	18.6	4	0	1
1940-1949	2	2.0	0	1	0
1950-1952	2	2.0	0	0	0
Totals	102	100.0	37	16	7

2. How many acres in the school site?

All but four of the schools reported the number of acres in the school site. Two of the schools reported having 70 acres, two as having 30 acres, and one as having 28 acres. The remaining 93 schools reported as follows: 20-25 acres, 6 schools; 15-19 acres, 1 school; 10-14 acres, 12 schools; 5-9 acres, 25 schools; 4 acres, 10 schools; 3 acres, 7 schools; 2 acres, 10 schools; 1 acre, 12 schools; and less than 1 acre, 10 schools.

II. The Site

The 102 schools in the study were asked to rate the site on which the high school or high schools were located by means of the following scale: 5—Satisfactory in every way; 4—Generally satisfactory, but improvable; 3—Generally satisfactory, but unimprovable; 2—Clearly unsatisfactory, but improvable; 1—Clearly unsatisfactory, but unimprovable; and N—Does not apply.

This rating scale was used by the schools in evaluation of the physical facilities other than site. Reference will be made to the rating scale whenever it is appropriate to do so.

Table 2 represents the average ratings for four categories of schools according to size on the thirteen items pertaining to site which are listed under Part B of Section Two, Criterion 5. In general the schools rated their sites somewhat higher than the description, *generally satisfactory, but improvable*. Only in the cases of items 9, 10, and 12 do we find instances where ratings fell below this description. Items 9, 10 and 12 are "adequacy as to size and form", "possibilities for future expansion" and "provision for out-door recreational activities."

If all thirteen items are considered as a group, the rankings of the groups of schools according to size are (1) 1000 or more students; (2) 99 or less students; (3) 100-299 students; and (4) 300-399 students.

Table 2

Average Ratings of the Site on Which the High School Buildings are Located

Item	Schools Enrolling			
	1000 or more	300-999	100-299	99 or less
1. Accessibility to school population	4.80	4.24(1)	4.49	4.44
2. Accessibility to roads or streets	4.80	4.69	4.62	4.75
3. Accessibility to public transportation	4.80	4.38	4.51(14)	4.79(2)
4. Accessibility to public utilities	5.00	4.96	4.81(3)	4.88
5. Character of environmental surroundings	4.20	4.46	4.31	4.31
6. Physical characteristics of the site	4.20	4.08	4.02	4.31
7. Location with reference to safety factors	4.40	3.92	3.96	4.44
8. Location with reference to promotion of health	4.40	4.42	4.47	4.44
9. Adequacy as to size and form	4.60	3.42	3.64	4.79
10. Possibilities for future expansion	4.50(1)	3.21(2)	3.38(2)	4.31
11. Landscaping and other aesthetic qualities	4.40	3.81	4.06(1)	3.75
12. Provision for out-door recreational activities	3.80	2.80(1)	4.51	3.88
13. Maintenance and appearance	4.80	4.46	4.29	4.31

Note: Numbers in parentheses indicate the number of schools which marked the item "N" (Does Not Apply)

III. The Building of Buildings

The schools evaluated their buildings using the scale described previously. Table 3 represents the average ratings for four categories of schools according to size on thirteen items pertaining to the building of school buildings.

In general, the schools rated their buildings somewhat higher than the description, *generally satisfactory, but improvable*. Only in the case of item 12 do we find instances where ratings fell much below this description. Item 12 reads, "adequacy of storage facilities".

If all thirteen items are considered as a group, the rankings of the groups of schools according to size are (1) 1000 or more students; (2) 99 or less students; (3) 300-999 students; and (4) 100-299 students.

TABLE 3
Average Ratings of the Building of the High School Buildings

Item	Schools Enrolling			
	1000 or more	300-999	100-299	99 or less
1. Location of the building on the site	4.60	3.96	4.36	4.75
2. Adequacy in size with reference to pupil population	4.60	3.77	3.92	4.88
3. Provision for flexibility of use and future re-grouping or rearrangement of rooms	4.60	3.62	3.63(3)	4.00
4. Quality of construction	5.00	4.35	4.16	4.25
5. Internal and external appearances	4.80	4.38	4.25	4.38
6. Arrangement of entrances and exits	4.80	4.38	4.33	4.56
7. Arrangement of driveways with reference to exits and floor levels to facilitate deliveries	4.40	3.73	3.85(3)	4.00(1)
8. General provisions for health and safety	4.40	4.23	4.11	4.38
9. Adequacy of stairways	4.80	3.96(1)	4.35(1)	4.56
10. Adequacy of corridors	4.40	4.46	4.31	4.81
11. Adequacy of exits	4.60	4.35	4.35	4.69
12. Adequacy of storage facilities	3.80	3.69	3.25	3.31
13. Adequacy of provisions to facilitate a modern program of secondary education	4.00	3.88	3.89	4.44

Note: Numbers in parentheses indicate the number of schools which marked the item "N" (Does Not Apply)

IV. BUILDING SERVICES

The schools evaluated their building services using the scale described previously. Table 4 represents the average ratings for four categories of schools according to size for eleven items pertaining to building services.

TABLE 4
Average Ratings of the Building Services by the 102 Schools

Item	Schools Enrolling			
	1000 or more	300-999	100-299	99 or less
1. Adequacy of provisions for natural lighting	4.00	3.73	3.76	3.88
2. Adequacy of provisions for artificial lighting	3.60	3.92	3.74	3.50
3. Provision of controls to assure proper illumination at all times	3.80	3.69	3.72(1)	3.60(1)
4. Adequacy of provisions for maintenance and control of proper temperatures	4.40	3.88	3.94(1)	4.50
5. Adequacy of provisions for maintenance and control of proper conditions of air	4.20	4.27	3.64(1)	3.81
6. Adequacy and sanitation of water supply	4.80	4.62	4.59	4.75
7. Location and adequacy of toilet and lavatory rooms	4.00	3.81	3.94	4.31
8. Adequacy of equipment and facilities in toilet and lavatory rooms	4.60	3.96	4.11	4.50
9. Adequacy of provision of facilities and equipment for school housekeeping	4.80	4.27	3.94(1)	4.25
10. Adequacy of facilities, equipment and other provisions for safeguarding against fire	4.40	4.50	4.24	4.38
11. Maintenance and repair of buildings and equipment	4.00	4.35	4.19	4.50

Note: Numbers in parentheses indicate the number of schools which marked the item "N" (Does Not Apply)

In general, the schools rated their building services somewhat higher than the description, *generally satisfactory, but improvable*. In no instance did the ratings fall far below this general description.

If all eleven items are considered as a group, the rankings of the groups of schools according to size are (1) 1000 or more students; (2) 99 or less students; (3) 300-999 students; and (4) 100-299 students.

V. Instructional Space, Equipment and Supplies

Part E on Instructional Space, Equipment and Supplies contains the following introductory explanation:

> Since pupils spend a large part of the school day in the classroom, laboratory, and shop—an environment that affects them strongly, although it may be subconsciously, for better or worse—it is important that the school provide environment (adequate space, appropriate equipment, and needed instructional supplies) and make and keep this environment an attractive one in which to live and learn. Because different types of educational programs and teaching-learning procedures make different calls on space, equipment and supplies, in making the evaluations called for in the following chart, the school will wish to keep in mind the program which it considers best for its pupils.
>
> Bearing these principles in mind, the school is asked to evaluate classrooms, laboratories, and other instructional space in terms of space provision: that is, number and size of rooms; location: best assignment in relation to structure and other facilities like library, auditorium, cafeteria; attractiveness: in the form and treatment of such items as floors, walls, woodwork, furniture, chalkboards, pictures; equipment: such as desks, chairs, bookcases, chalkboards, bulletin boards, cabinets, machines in shops, unit kitchens in home economics; supplies: such as reference books, periodicals, paper, materials for laboratories, shops, and home economics.

Table 5 represents the average ratings of the various areas of instruction using the rating scale described previously on page 12. The areas of instruction were evaluated in terms of the number of rooms, size of rooms, location, attractiveness, equipment, and supplies.

The average ratings of the various areas of instruction in terms of the (1) number of rooms varied from 3.13 for *Art* to 4.45 for *Core Program;* (2) size of rooms, from 3.72 for *Music* to 4.66 for *Foreign Language;* (3) locations, from 3.67 for *Music* to 4.78 for *Mathematics;* (4) attractiveness, from 3.82 for *Art* and *Physical Education for Girls* to 4.44 for *Core Program;* (5) equipment, from 3.77 for *Physical Education* for both boys and girls to 4.28 for *English* and *Mathematics;* and (6) supplies, from 4.00 for *Physical Education for Girls* to 4.52 for *Business Education.*

VI. The Library, Location and Equipment

Part F on the Library, Locations, and Equipment is preceded by the two following introductory paragraphs:

> In the modern secondary school, the library is the nerve center of the educational program. It is the intent of this part of the study of Form A-3 to call to your attention the adequacy of your present library with respect to its location, size, and equipment. Last year the library part of Form A-3

TABLE 5
Average Rating of Sixteen Areas of Instruction by the 102 Schools

Area	Percentage			Average Rating					
	Does Not Apply	No Replies	Replies	No. of Rooms	Size of Rooms	Location	Attractiveness	Equipment	Supplies
1. Core Program	31.4	44.1	24.5	4.45	4.24	4.60	4.44	4.16	4.40
2. Agriculture	17.6	28.5	53.9	3.69	4.36	4.18	3.95	4.11	4.36
3. Art	28.4	32.4	39.2	3.13	3.83	3.92	3.82	3.90	4.18
4. Business Education	1.0	14.7	84.3	3.72	4.45	4.65	4.33	4.22	4.52
5. English	0.0	12.7	87.3	3.79	4.30	4.62	4.20	4.28	4.43
6. Foreign Language	14.7	27.5	57.8	3.44	4.66	4.76	4.25	4.27	4.32
7. Health	12.7	26.5	60.8	3.56	4.42	4.51	4.20	4.14	4.17
8. Home Economics	1.0	14.7	84.3	3.73	4.16	4.40	4.21	4.16	4.42
9. Industrial Arts	4.9	26.5	68.6	3.46	4.23	4.37	4.04	3.90	4.21
10. Indust.-Vocat. Art	33.3	46.1	20.6	3.39	4.10	4.24	3.86	4.05	4.24
11. Mathematics	0.0	11.8	88.2	3.73	4.47	4.78	4.27	4.28	4.41
12. Music	0.0	14.7	85.3	3.24	3.72	3.67	3.90	4.21	4.41
13. Phys. Ed.: Boys	0.0	17.7	82.3	3.18	3.92	4.20	3.88	3.77	4.07
14. Phys. Ed.: Girls	1.0	16.7	82.4	3.23	3.87	4.12	3.82	3.77	4.00
15. Science	0.0	11.8	88.2	3.47	4.24	4.44	4.16	4.03	4.21
16. Social Studies	0.0	12.7	87.3	3.83	4.43	4.70	4.16	4.25	4.40

dealt with library materials, their administration, and their use. Each study can serve to supplement the other, so that both of them will furnish the basis for any suggestions for improvement to be made in your present school plant or for a more ideal set-up in a new building.

Various characteristics and appurtenances of a library are listed below. Some of them are to be checked only. Some are to be filled in with the data called for. Others are to be evaluated according to the rating scale described previously in terms of their present contribution to the school's educational program and any improvement that may be made.

1. Is the library located in a special room or in a combination study-hall?

   Of the 102 schools in the study, 26.5 per cent said the library was located in a *special room,* 64.7 per cent said it was located in a *combination study-hall,* and 8.8 per cent said the library was housed both in a *special room* and in a *combination study-hall.*

2. Is the library centrally located with respect to the rest of the building or buildings?

   Of the 102 schools in the study 82.3 per cent said *yes,* 13.7 per cent said *no,* and 4.0 per cent did not reply to the question.

3. What percentage of the total school enrollment can be accommodated at any one time in the library?

   The median percentages were as follows for schools enrolling over 1000 pupils—4 per cent; from 300-999 pupils—15 per cent; from 100-299 pupils —17 percent; and 99 or less pupils—27 per cent.

4. Evaluate the general attractiveness of the library.

   Schools enrolling over 1000 pupils had an average rating of 5, or, *satisfactory in every way.* Schools enrolling from 300-999 pupils had an average rating of 4.04 or *generally satsfactory, but improvable.* Schools enrolling from 100-299 pupils had an average rating of 3.67 or between *generally, satisfactory, but improvable* and *generally satisfactory but unimprovable.* Schools enrolling 99 or less pupils had an average rating of 4.0 or *generally satisfactory, but improvable.*

Table 6 indicates the percentage of schools providing the twelve items o library equipment indicated. Provision was lowest for *conference rooms* and *librarian's office* and highest for *charging desks, cabinets for card catalogs,* and *magazine and newspaper racks.*

Using the rating scale described previously, the average ratings clustered around 4.00 or slightly above. Thus, if the schools provided the equipment, they rated it *generally satisfactory, but improvable.*

TABLE 6

Provision and Evaluation of Library Equipment by the 102 Schools

Equipment	Percentage of schools providing equipment*	Average rating of equipment
1. Reading tables and chairs	89.2	3.96
2. Charging desks	97.1	4.14
3. Cabinets for card catalogs	97.1	4.21
4. Magazine and newspaper racks	97.1	4.13
5. Dictionary stands	90.2	4.36
6. Filing cabinets	74.5	4.10
7. Librarian's office	28.4	4.12
8. Librarian's workroom	44.1	4.13
9. Bulletin board	89.2	4.08
10. Acoustical treatment	40.2	4.30
11. Shelving for books	98.0	4.24
12. Conference room(s)	20.6	4.11

*Percentage of schools not replying varied from 1 to 4 per cent.

VII. SPECIAL SERVICES

Part G on Special Services begins with the following introductory paragraph of explanation:

> Special service rooms and facilities will differ in terms of the needs and resources of individual schools and the type of educational program provided. For the small school some of the special services considered below will be combined or omitted. The "community school" will modify some of the special facilities to serve community needs as well as those of the school. In the large school a general auditorium may be supplemented by a little theater, a music room, and other meeting rooms, and a swimming pool may represent an important adjunct to the gymnasium. It may be necessary—although undesirable—for the small school to economize by use of a combined auditorium-gymnasium. Through use of tables and benches folding into the wall, the gymnasium of the small school may double as a lunch room. Other adaptations will suggest themselves in terms of local situations.

Using the rating scale described previously, the schools possessing the special service areas indicated in Table 7 rated these areas in terms of space provision, location, attractiveness, equipment, and supplies.

The average ratings ranged from 3.31 to 4.50 with a median average rating of about 3.8. Thus in general, the schools rated their special service areas as a total slightly below the description *generally satisfactory, but improvable.*

TABLE 7

Average Ratings of Special Service Areas by 102 Schools

Area	Percentage			Average Rating				
	Does Not Apply	No Replies	Replies	Space Provision	Location	Attractiveness	Equipment	Supplies
1. Office and staff rooms	0.0	5.9	94.1	3.65	4.38	4.20	4.12	4.52
2. Committee and conference rooms	24.5	18.6	56.9	3.31	3.55	3.69	3.67	3.71
3. Teacher's rest rooms	27.4	12.8	59.8	3.59	3.69	3.70	3.80	4.03
4. Auditorium	2.0	2.0	96.0	3.89	4.11	3.98	3.85	3.95
5. Audio-visual center	19.6	12.8	67.6	3.51	3.64	4.34	3.91	4.00
6. Gymnasium	0.0	7.8	92.2	3.60	4.02	3.78	3.76	3.88
7. Cafeteria	36.3	12.8	50.9	4.00	3.39	4.08	4.21	4.44
8. Health unit	35.3	19.6	45.1	3.39	3.74	3.78	3.72	3.93
9. Guidance unit	24.5	15.7	59.8	3.75	3.95	3.84	3.77	3.95
10. Social and recreation unit	30.4	16.7	52.9	3.94	3.89	3.93	3.96	3.87
11. Bookstore	56.9	22.6	20.5	3.38	3.57	3.48	3.48	3.62
12. Study and sleeping quarters (for boarding schools)	66.7	29.4	3.9	4.50	4.25	4.50	4.50	4.50
13. Pupil activity rooms (Student council office, publications office, etc.)	3.04	16.7	52.9	3.72	3.89	3.78	3.87	4.04

VIII. STORAGE AND PROTECTION OF RECORDS AND SUPPLIES

The schools were asked to indicate the type of storage provided for records of a permanent type and whether or not the storage was fireproof. Table 8 indicates the type of storage provided for four types of permanent records.

Pupil permanent records are apparently the best cared for and staff personnel records the least cared for with the greatest percentage stored in files. About thirty per cent of the staff personnel records are not kept in fireproof equipment.

TABLE 8

Storage and Protection of Pupil Permanent Records

Records	Percentage No Replies	Percentage stored in:				
		Vault	Safe	File	Combination of Vault, Safe, and File	Percentage Fireproof
1. Pupil permanent records	2.0	43.1	29.4	8.8	16.7	93.0
2. Staff personnel records	2.9	31.4	20.6	37.3	7.8	70.7
3. Inventory records	2.9	36.3	26.5	27.5	6.8	80.8
4. Financial records	3.9	35.3	35.3	20.6	4.9	85.7

The adequacy of the storage space for various supplies and equipment is indicated in Table 9. The average ratings ranged from 3.84 for *special service*

equipment to 4.23 and 4.24 for *administrative equipment* and *administrative supplies* respectively. In general the adequacy of storage space for supplies and equipment as a total was rated slightly below the description *generally satisfactory, but improvable.*

TABLE 9

Adequacy of Storage Space for Various Supplies and Equipment

Item	Percentage			Average Rating
	Does Not Apply	No Replies	Replies	
1. Instructional supplies	0.0	2.0	98.0	4.08
2. Instructional equipment	0.0	2.0	98.0	3.95
3. Special departmental supplies	0.0	3.0	97.0	3.98
4. Special departmental equipment	1.0	3.0	96.0	3.96
5. Library supplies	0.0	2.0	98.0	3.86
6. Library equipment	0.0	2.0	98.0	3.94
7. Special service supplies	4.0	11.0	85.0	3.89
8. Special service equipment	4.9	8.8	86.3	3.84
9. Student activity supplies	2.0	3.9	94.1	3.86
10. Student activity equipment	2.0	3.9	94.1	3.85
11. Janitorial supplies	0.0	2.0	98.0	4.10
12. Janitorial equipment	0.0	2.0	98.0	4.08
13. Administrative supplies	0.0	2.0	98.0	4.24
14. Administrative equipment	0.0	2.0	98.0	4.23

PART IV

Plans for Possible Future Development

The section on future expansion is summarized here in terms of two questions:

1. By 1961, will it be necessary to add to and to modernize the present plant?
2. By 1961, will it be necesary to provide expanded facilities in the form of an entirely new plant?

The replies to these questions are summarized in Table 10. In general, as the size of the schools increased, there was an accompanying increase in the percentages of schools indicating that modernizing the present plant and expanding the present facilities in the form of an entirely new plant will be necessary by 1961. This statement does not hold for schools enrolling 1000 or more pupils.

TABLE 10

Modernizing and Expanding School Facilities

Question	Schools Enrolling:	Percentage of Schools Replying as Indicated			
		0-99	100-299	300-999	1000 or more
1. By 1961, will it be necessary to add to and to modernize the present plant?	Yes	31.3	43.6	53.9	0.0
	No	46.3	34.6	30.8	60.0
	No replies	12.4	21.8	15.3	40.0
2. By 1961, will it be necessary to provide expanded facilities in the form of an entirely new plant?	Yes	6.3	10.9	15.4	0.0
	No	87.4	63.6	65.4	100.0
	No replies	6.3	25.5	19.2	0.0

PART V

Summary

The combining of the separate reports of the 102 schools, although probably not highly reliable, has brought out certain strengths and weaknesses of the Kansas North Central high schools in providing housing for students.

Community Factors Affecting the School Building Program

A good majority of the schools indicated that the financial resources of the community available for school purposes would probably be *markedly greater* in 1958-59 as compared to the year 1951-52. A small percentage indicated that the financial resources would be *markedly lower.*

About seventy per cent of the schools indicated that the readiness of the school community to provide good secondary education had *been uniformly high* and another 25 per cent indicated that this readiness had *shown marked increase.* Furthermore, about 70 per cent said they felt that such readiness would increase by 1958-59. About a fourth of the schools did not expect such readiness to increase by 1958-59.

About two-thirds of the schools said that the school district was geographically the same in 1951-52 as it was in 1948-49, while about a third said it had changed geographically. About 60 per cent of the schools felt that the school district would be geographically the same in 1958-59, while about 40 per cent felt that it would be geographically different.

About a fourth of the schools had gone through a reorganization of the school system since 1948-49, and about a fourth felt that the school system would be involved in reorganization by 1958-59.

About 13 per cent of the schools said that the construction or expansion of other secondary schools had reduced the enrollment of the school since 1948-49. About 11 per cent expected further reduction of enrollment by 1958-59 from this source.

About 5 per cent of the schools had experienced increased enrollments since 1948-49 because other secondary schools had been closed. About a fourth of the schools expected increased enrollments by 1958-59 from this source.

The administration of compulsory school attendance was reported slightly *more effective* in 1951-52 as contrasted to 1948-49. About 14 per cent of the schools felt that the compulsory school age limit would be raised in Kansas by 1958-59.

About 80 per cent felt that the holding power of the secondary school had *been uniformly high,* while 14 per cent felt that it had *shown marked increase.* About a third of the schools felt that the holding power of the secondary school would show *a marked increase* by 1958-59, while 65 per cent expected *no change.*

In light of the answers above and the high birthrate in the years 1940-1950, the schools expected the enrollment in 1958-59 to be from 121 to 126 per cent of the enrollment as actually recorded in 1951-52.

Educational Factors Affecting the School Building Program

About 70 per cent of the schools said that the secondary educational program meets the needs of all normal pupils, while about 28 per cent said it did not.

About 21 per cent of the schools said that the secondary school made special provisions for the mentally handicapped. About 49 per cent made special provisions for the scholastically handicapped and about 36 per cent made special provisions for the physically handicapped.

About 27 per cent *generally* used the question-and-answer recitation as an instructional pattern, while another 68 per cent used the pattern *moderately*. Only 5 per cent used it *rarely*.

About 54 per cent of the schools *generally* used varied learning activities with much pupil participation as the instructional pattern, while another 45 per cent used the pattern *moderately*.

About 58 per cent of the schools provided food services in whole or in part, and about 83 per cent of the schools provided health services in whole or in part. About 90 per cent of the schools provided guidance services in whole or in part, and about 56 per cent of the schools provided transportation services in whole or in part. Almost all of the schools provided recreational services in whole or in part, and about 57 per cent provided adult services in whole or in part.

Several emerging trends in secondary education seemed to be reflected in the educational program as:

1. A majority of the schools were thinking in terms of a core program as defined.
2. A high percentage of the schools were employing some adaptation of the classroom library.
3. A very high percentage were using the school as a community center.
4. A very high percentage were using audio-visual aids in the classroom.
5. Some of the schools were incorporating camping and outdoor education into the program.
6. About half of the schools were providing work experience as part of the school program.

School Plant and Equipment

A majority of the schools built the first unit during the years 1910-1929, and about 64 per cent of these found it necessary to make one or more additions. About 21 of the schools said that the school was located on a site of 10 or more acres.

The schools rated the site on which the buildings are located somewhat higher than the description, *generally satisfactory, but improvable*. The schools rated their buildings and their building services with the same description as for the site.

In rating the areas of instruction, the schools ratings were: (1) lowest for *Art* and highest for the *Core Program* in terms of the number of rooms; (2) lowest for *Music* and highest for *Foreign Languages* in terms of the size of rooms; (3) lowest for *Music* and highest for *Mathematics* in terms location; (4) lowest for *Art* and highest for *Physical Education for Girls* and for *Core Program* in terms of attractiveness; (5) lowest for *Physical Education* for boys and girls and highest for *English* and *Mathematics* in terms of equipment; and (6) lowest for *Physical Education for Girls* and highest for *Business Education* in terms of supplies.

About a fourth of the schools said the library was located in *a special room*, while about 65 per cent said it was located in a *combination study-hall*. About 9 per cent used both methods of housing the library. About 82 per cent said the library was centrally located with respect to the rest of the building. The per-

centage of the student body that could be accommodated in the library ranged from 4 per cent for the largest size schools to about 27 per cent for the smallest size schools. The general attractiveness of the library for the schools as a whole carried the description, *generally satisfactory, but improvable.* Provision was lowest for *conference rooms* and an *office for the librarian* and provision was highest for *charging desks, cabinets for card catalogs,* and *magazines and newspaper racks.* The ratings for library equipment of various kinds clustered around the description, *generally satisfactory, but improvable.*

The ratings of the adequacy of the storage spaces for various supplies and equipment were lowest for *specal service equipment* and highest for *administrative equipment and supplies.* In general, the ratings were slightly below the description, *generally satisfactory, but improvable.*

Plans for Possible Future Development

None of the schools enrolling 1000 or more students felt that the present plant would need an addition or a modernization program by 1961. None of these same schools felt that expanded facilities in the form of an entirely new plant would be needed by 1961.

These same statements do not hold for schools enrolling under 1000 students. A goodly percentage of the schools under 1000 students felt that an addition to or a modernization of the present plant would be necessary by 1961. A small percentage of the same schools felt that expanded facilities in the form of an entirely new plant would be necessary by 1961.

Summary

In terms of the community and educational factors discussed, and in terms of the provisions for and ratings of the school plant and equipment, the North Central high schools of Kansas should receive a "pat on the back" for a good job done in the past. It is evident, however, that all is not perfect and improvements can and should be made in existing facilities. It is also evident that many of the schools will need new plants and equipment. Any modernization program of existing facilities or the provision of new facilities should take into account the emerging trends in secondary education. To be short sighted at this time in the provision of facilities is only to jeopardize the education of future Kansas boys and girls. Schoolmen and teachers too, should insofar as possible, avail themselves of every opportunity to enlarge their grasp and understanding of the correlation which should exist between the school plant and the best educational program possible for their respective communities.

Addendum to Report on Criterion 5:

ACOUSTICAL CONSIDERATIONS OF SCHOOL BUILDINGS

James F. Nickerson
Department of Music Education, University of Kansas

As one reads the foregoing report, one very evident omission becomes apparent, that of sufficient attention to acoustic conditions. Only one item appears in the questionnaire (Section F: The Library, Location and Equipment), and it suffers the curse of all-inclusiveness as well as ambiguity. Such an omission may

reflect two things: *first,* that we're not really conscious of the role of acoustic conditions in the schoolroom, at least not sufficiently to be inclined to do much about it; and *second,* that we lack an understanding of the nature of sound transmission and its control and how to make functional evaluation of acoustic conditions.

Evaluating acoustic conditions in a school is not easy. Most of us have a tendency to respond to sound in a generalized and non-objective way. When we say the acoustics are bad, we can mean practically anything, such as "noisy", "can't hear", "too live", "too dead", "sounds like a barn" or "depressing". Such a response is hardly specific enough to guide any correction of bad acoustic conditions or to help in laying down the functional needs and specifications for sound conditions in a new building.

Summing up our own personal observations of hundreds of our present buildings now in use, scores of the new buildings just completed or being completed, and in reading the blueprints of many more about to be built, it is disheartening to note the errors we are still committing, the oversights, the "expensive" compromises made in the name of economy, and the plans which are determined largely by "eye appeal" with little or no regard for "ear appeal".

Too few blueprints show adequate provision for the control of sound, whether by judicious use of site, the interrelation of rooms both vertically and horizontally, the over-all shapes of the rooms, or the choice of materials and finishes. And we must ask, how many years must pass after a building is completed and presented to the taxpayers and children of a community before we can admit the errors and oversights which were committed on the drawing board and begin to work toward their correction? Rarely does one find an older school building in which any serious attempt has been made to correct acoustical errors, and this is true in spite of a half century of work behind us in the field of architectural acoustics and at least two decades of important work on the psychological factors behind our responses to acoustic conditions.

There are two parts to the problem of achieving good sound conditions in schools: the exclusion of the ***unwanted*** sounds (noise control) and the control of the ***wanted sounds*** (sound distribution and reverberation control).

Fortunately, a school room does not produce sound levels of sufficient strength or duration to cause damage to the hearing mechanism as do certain industrial functions, but we need to achieve the reasonably low background noise levels which are necessary to prevent undesirable physiological reactions which unfavorably influence pulse rate, breathing and digestion and also produce sustained bodily tension and excessive fatigue. Even more subtle are the psychological influences which can occur at almost any level of sound. Annoyance and discomfort can arise from excessive stimulation of the nervous system by loud or startling noises, noises that take us by surprise or are unexpected, "out-of-place", or incongruous. A common disturbance is the feeling of intrusion of privacy associated with hearing the sounds of others, or the fear of having confidential conversations heard by others. As long as sounds convey undesired information, they constitute a potential annoyance. Furthermore, at excessive interference levels, the frustration of attempting to converse and the fatigue of compensatory speaking and listening take their toll.

In the control of the wanted sounds, two considerations come first: *intelligibility* and *the desirable and natural quality of sounds*. In the larger rooms we are also concerned with good distribution and sufficient loudness of sound throughout the entire room or auditorium.

It is not the purpose of these comments to outline in any detail the methods of exclusion of sound or the control of sound within a room. At most we can only suggest that the usual techniques are careful selection of site, good layout of instructional areas and appropriate structural barriers to sound travel in walls, floors, ceilings, windows, doors, and ventilating systems. Good siting and layout serve to keep noisy areas away from those needing low background noise. A judicious use of hallways, service areas, storage rooms and vestibules, even landscaping, as sound locks, provides sound barriers at little or no additional cost. Considerable saving in expensive structural insulation can be achieved if sufficient care is exercised in the original siting and layout.

To insure intelligibility and desirable quality of sound, we can say that intelligibility hinges on low background noise, sufficient separation of individual sounds (the individual speaking rate is five syllables per second) and appropriate loudness of the speech signal *above* the background noise. The naturalness of sounds depends upon appropriate reinforcement of voice or music by limited reflections from room surfaces or furniture and upon the resonant qualities of the room itself. An optimum between too much reflection and too little reflection is necessary, and it is usually expressed in terms of reverberation time, the time it takes a sound to decay sixty decibels, which is approximately the time it takes a sharp handclap to die away.

The techniques suggested above are quite well defined (See particularly Bibliography items 2 and 4). There is nothing mystical in the approach or the solution. While it is certainly questionable whether an administrator or teacher should be expected to be able to work the problem of acoustic specifications out in any detail, it seems only reasonable that some understanding of the principles and techniques involved in sound control should be a part of his technical knowledge, *but,* more significantly, he should be able to make functional judgments of the adequacy of sound in his building and be able to specifiy his needs in definable and tangible terms.

It is this functional analysis with which these comments are primarily concerned. Until schoolmen do define the problem clearly and make their requests specific in terms of specified needs and estimated cost, nothing much will happen to better the acoustic conditions in our classrooms.

We have one functional test available which is useable and fairly well standardized: the word and sentence articulation tests (See Bibliography items 2 and 4). Words or sentences are pronounced by a speaker, or presented by recording, in a normal manner to teams of four or five listeners stationed at representative positions around the auditorium. The correctness of the responses affords a "per cent articulation" for the several locations and gives a clean cut evaluation of the speech intelligibility over the entire floor space in that room.

Speech can be highly intelligible yet distorted to a point where it is unnatural and even offensive. An articulation index should be accompanied by some form or rating of quality, perhaps on a criterion of "naturalness", or on the basis of "disturbance".

Some of our other concerns in functional measure are the reactions of performers such as musicians, to a stage or rehearsal room. We need ratings in terms

of freedom from distracting noises, ability to hear critically both self and ensemble, and nature of sound quality, that is, its naturalness and pleasantness. Similarly we can seek audience ratings of disturbance of background noise, discreteness of echo, loudness level of wanted sounds or adequacy of public address system. The latter can be in terms of awareness, offensiveness, or appropriateness of apparent "source" of amplified sound. We can explore the use of the criterion of "awareness" or "disturbance" by means of per cent of persons aware of or disturbed by echo, noise levels and the like. Even the more subjective responses of sense of "intimacy" or "belonging" can be sought .These latter are primarily functions of side wall echoes and indefiniteness or inappropriateness of directional source of sound.

In the classroom we can explore intelligibility of speech from the usual points of origin, awareness and disturbance of distracting noises from ouside as well as those within a room, and fatigue measures or ratings after sustained study or recitation.

There is no reason to believe that an enterprising student, whether he be acoustician, psychologist, educator, or combination of all three, could not develop, in the near future, good functional tests of classroom, cafeteria, or music room based upon somewhat standard material, perhaps recorded, which would serve as useable material to point up our acoustic weaknesses. To this we might correlate some physical measures. A noise survey meter is not prohibitive in cost; rough estimates of reverberation time can be made by handclap or recorded sounds; simple calculations can reveal the optimum absorption for a room, the present absorption, and the additional materials needed. Technical advice, though not always without bias, is available from the representatives of the major applicators and distributors of acoustical materials.

Our problem is not unsolvable if we have sufficient will to do something about it. It is this writer's earnest hope that the North Central Association of Secondary Schools and Colleges will concern itself with acoustic conditions in its member schools: first, by getting some functional data on its schools; and second, by aiding in disseminating information and guidance for the correction of errors in the old and in planning for better sound in the new.

Bibliography

1. Best, Clarence J. (Ed.) *Music Rooms and Equipment*. Research Council Bulletin No. 17. Chicago: Music Educator's National Conference. 1949.
2. Bolt, Richard H., and Newman, Robert. "Architectural Acoustics." *Architectural Record*, 107 (April, June, Sept., Nov. 1950) 165, 148, 166, 158.
3. Burris-Meyer, Harold and Cole, Edward C. *Theaters and Auditoriums*. New York: Rheinhold. 1949.
4. Knudsen, V. O. and Harris, C. N. *Acoustic Designing in Architecture*. New York: John Wiley and Sons. 1950.
5. Nickerson, James F. "Schoolroom Acoustics." *University of Kansas Bulletin of Education*, 7 (Nov. 1952) 17-21.
6. Nickerson, James F. "Schoolroom Acoustics. Part II: The Control of Unwanted Sound." *University of Kansas Bulletin of Education*, 7 (Feb. 1953) 44-48.
7. Nickerson, James F. "Schoolroom Acoustics. Part III: The Control of Wanted Sound." *University of Kansas Bulletin of Education*, 7 (May 1953) forthcoming.
8. *The Noise Primer*. Cambridge: General Radio Company. 1948, 3rd Edition.
9. Sabine, H. J. *Less Noise, Better Hearing*. Chicago: Celotex Corporation. 1941.
10. *Theory and Use of Architectural Acoustical Materials*. Chicago: Acoustical Materials Association. 1951.